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(G*) Characterization of VUV sensitive silicon photomultipliers

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Silicon photomultipliers (SiPMs) are emerging as the photodetector technology to be used in upcoming noble liquid experiments. Features that make SiPMs an ideal candidate to detect light signals include their compact size, insensitivity to magnetic field, high gain, low operating voltage, low dark noise rate and sensitivity to single photon counting. Newly developed SiPMs sensitive to vacuum ultraviolet (VUV) light will be directly used for the readout of scintillation photons (λ = 175nm) from liquid xenon in future tonne-scale experiments such as nEXO searching for neutrinoless double beta decay in 136Xe. The primary goal of this research project is to characterize the VUV-SiPMs using current-voltage (IV) and pulse-level measurements. These data are analysed to extract the SiPM's features like breakdown voltage, gain, crosstalk, afterpulsing, dark noise rate and photon detection efficiency. In this talk, the results from IV curve-based and pulse-level characterisation of SiPMs from two different vendors over a range of temperatures will be presented.

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